ATTACHMENT K

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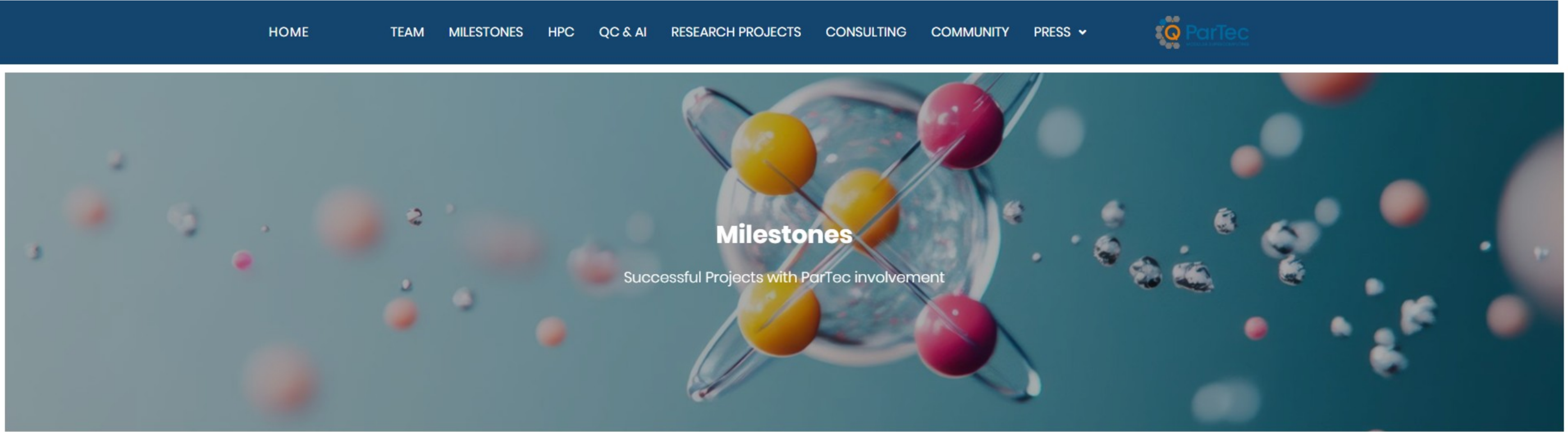
Milestones
Successful Projects with ParTec involvement

At ParTec, we believe in bringing research to production. Through innovation, collaboration, and dedication, our projects are transforming industries, communities, and lives. This page showcases the most important milestones and successful initiatives that highlight our expertise and commitment to excellence.

2005: KEY PARTNERSHIP

Start of cooperation with the Jülich Research Centre (Forschungszentrum Jülich, FZJ).

2010: DEVELOPMENT OF THE "DYNAMIC MODULAR SYSTEM ARCHITECTURE"

Around 2005, ParTec began developing what became known as "software-defined hardware," leading to the patented **dynamic Modular System Architecture (dMSA)** in 2010. This innovation enabled dynamically adjustable processor and supercomputer architecture, moving beyond static designs to meet evolving computational demands. In collaboration with the Jülich Research Center, dMSA allowed for the development of advanced facilities, including JUPITER, the world's largest AI supercomputer, and other leading systems in Europe. A key feature of dMSA is its ability to intelligently allocate and reconfigure diverse processors, such as CPUs and GPUs, during computation.

Further details can be found here.

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2011: START OF EUROPEAN RESEARCH PROJECTS DEEP

The **Dynamical Exascale Entry Platform (DEEP) projects** (DEEP, DEEP-ER, DEEP-EST) developed a flexible, energy-efficient Exascale supercomputing platform while optimizing key European HPC simulation codes. ParTec played a central role, engineering the runtime, middleware, and fault-tolerance modules for these groundbreaking systems.

Further details can be found here.

2017: OPERATION OF JURECA

JURECA (Jülich Research on Exascale Cluster Architectures) is the world's first modular supercomputer featuring a heterogeneous network landscape and powered by ParaStation Modulo. It is managed by the Jülich Supercomputing Centre at Forschungszentrum Jülich.

This cutting-edge system features a versatile Data Centric (DC) module built on the Atos BullSequana XH2000, incorporating top-tier components. Its innovative architecture enables seamless support for diverse high-performance computing and data analytics workloads.

Further details can be found here ↗.

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2020: OPERATION OF JUWELS "BOOSTER"

JUWELS (Jülich Wizard for European Leadership Science), a mulit-petaflop modular supercomputer managed by the Jülich Supercomputing Centre at Forschungszentrum Jülich, supports the Earth System modeling and AI research within the Helmholtz Association. It was the fastest supercomputer in Europe at the time and # 7 on the TOP500 list. JUWELS was Europe's first accelerated full AI-compatible supercomputer using ParaStation Modulo.

Further details can be found here ↗.

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2021: REALIZATION OF MELUXINA

In June 2021, LuxProvide introduced the MeluXina supercomputer, built on the EVIDEN BullSequana XH2000 platform, delivering 18 PetaFlops of computing power and 20 PetaBytes of storage. With its scalable architecture and GPU AI accelerators, MeluXina seamlessly integrates simulation, modeling, data analytics, and AI. Ranked 36th globally and recognized as the greenest supercomputer in the EU in the Top500 ranking, the system was realized with ParTec as a key technology partner.

Further details can be found here ↗.

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2022: MARENOSTRUM5 AND INQI

MARENOSTRUM5

MareNostrum 5, a pre-exascale EuroHPC supercomputer hosted by Barcelona Supercomputing Center – Centro Nacional de Supercomputación (BSC-CNS), was awarded to consortium with ParTec as a subcontractor. It is powered by a combination of Bull Sequana XH3000 and Lenovo ThinkSystem architectures, delivering a total peak performance of 314 PFlops. The system features four partitions with distinct technical characteristics, designed to meet the diverse needs of HPC users. Further details can be found here ↗.

INQI

ParTec was successful in the participation of the tender for the Israel National Quantum Initiative (INQI). INQI was set up as an international Quantum-Computing Center, which will develop different Quantum Technologies for academical and industrial purposes. Further details can be found here ↗.

2023: MARKET LAUNCH OF QBRIDGE AND CONTRACT JUPITER

QBRIDGE

Quantum computers differ greatly from classical ones in both architecture and programming, making integration into existing HPC systems challenging. QBridge offers a groundbreaking solution, enabling hybrid, low-latency workflows between HPC and quantum platforms. Developed by ParTec and Quantum Machines, this software facilitates seamless quantum-HPC integration and multi-user access to quantum computers. Further details can be found here.

JUPITER

In 2023 the German-French consortium of ParTec and Eviden secured a contract with EuroHPC JU to deliver Europe's first Exascale supercomputer, JUPITER, to the Jülich Supercomputing Centre. The system will use ParTec's dynamic Modular System Architecture and advanced GPUs and CPUs from NVIDIA and SiPearl. JUPITER will provide groundbreaking computing power, driving innovation in critical scientific domains across Europe. Further details can be found here.

2024: JEDI, JETI AND ELBJUWEL

JEDI

The first module of the JUPITER exascale supercomputer, named JEDI, has been ranked number one on the Green500 list of the most energy-efficient supercomputers globally. This milestone follows its installation in April by the ParTec-Eviden consortium. JEDI features the same hardware as the JUPITER booster module under construction at Forschungszentrum Jülich. Further details can be found here.

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JETI

The completion of **JETI**, the second module of the JUPITER system, marks another major milestone. By doubling the performance of JUWELS Booster, Germany's fastest supercomputer, JETI now ranks among the world's most powerful. JETI is already one-twelfth of the final JUPITER system's power, setting a new benchmark on the TOP500 list. Further details can be found here.

ELBJUWEL

ParTec AG and Helmholtz-Zentrum Dresden-Rossendorf (HZDR) have signed a memorandum to jointly develop and operate an AI supercomputer. The project aims to foster innovation in AI technologies for scientific and economic advancement in Saxony and Germany. ParTec will provide the 'ELBJUWEL' AI computer, delivering up to 500 petaflops or 50 exaflops, making it one of the world's most powerful AI systems. Further details can be found here.

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